INTELLIGENT SYSTEMS

Doing More Than Humanly Possible

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Human Factors, Robotic & Remote Systems

Improving human performance in critical and complex environments through the integration of intelligent systems and advanced robotics is our mission. And the result is that we're now doing more than humanly possible.

About the Department

The Human Factors, Robotic & Remote Systems department is a multidisciplinary team of scientists and engineers devoted to improving human performance and decision-making through the integration of advanced and emerging technologies. It employs the largest group of human factors, operations and systems analysis professionals within the DOE complex.

Human machine interfaces improve human safety, performance and productivity.

Leading the Way

The department leads the INEEL's *Intelligent Systems Initiative* that explores new concepts in "human machine" teaming, and leads the way to accomplish what was once considered impossible. Through the initiative, hybrid human machine technology is created to accomplish tasks that today's most sophisticated human or mechanical capabilities cannot do alone. By reducing complex processes to simplify procedures for both people and machines, we are developing high performance solutions to an array of difficult and ever changing problem areas. These solutions involve autonomous command and control systems, enhanced visualization techniques for inspecting and mapping field conditions, and advanced techniques to acquire and apply new knowledge.

Key Capabilities

For over 20 years, the department has been a preferred provider of "Human Factors" support to the DOE—especially for reactor programs. And for more than 25 years, it has developed and deployed remote, robotic and intelligent systems for field operations at the INEEL and across the DOE complex. Our technical staff applies their unique science and engineering

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capabilities to resolve grand challenges facing our clients. Our relevant experience includes:

Regulatory environments

- safety and risk analysis
- procedures design, development, assessment
- training design, review, delivery
- analysis of operating events
- human reliability analysis
- human machine interface design and development guidance
- decision-making models

Advanced human machine interfaces

- intelligent agents (autonomous behaviors, tasks)
- command and control architectures
- land, air, water robotic applications
- advanced robotic platform testing
- hazardous environment applications

General human performance

- usability testing
- design and conduct full compliment of laboratory services
- human performance modeling for extreme environments
- data visualization.

3-D training scenarios are tailored for specific instruments and stress conditions.

Collaborations

The department uses unique partnership and funding mechanisms to launch critical business relationships. Our partners include international government agencies, private industries, universities and federal agencies with national security, energy, defense and resource management responsibilities. These collaborative research and development efforts yield many innovative and patented technologies. The resulting technologies are shared and licensed to others who market the technologies to industry and government sectors.

The department works for a variety of government agencies, including the Department of Defense in the area of intelligent systems for military infrastructure and national security interests, and NASA—for whom we developed human reliability assessment and training tools. Other clients include private sector agricultural, mining and oil and gas industries; decontamination and decommissioning, energy, environmental management, and science and technology interests.

Products and Services

For two decades we've had a history of preparing a variety of Human Factors, Robotics, and Remote Systems products and services for a large number of government agencies and private industries. A detailed listing is available upon request.

User friendly software and hardware configurations help emergency responders make time-critical decisions.